# JOINT MANAGEMENT PLAN REVIEW

# DRAFT ACTION PLAN: BEACH CLOSURE AND MICROBIAL CONTAMINATION

**REVISED: April 9, 2003**

---

**Please Note**: The MBNMS and the Sanctuary Advisory Council have tasked the management plan working groups with development of draft action plans that characterize the issue or problem and identify strategies and activities that address the issue. The working groups will develop these strategies and activities as they meet over the next several months. With this goal in mind, the progress of the group, the decisions, and areas of agreement will be outlined in a progressively developed action plan identifying draft goals, issue characterizations, and strategies and activities. Members of the group as well as other interested parties should look to this draft action plan as it develops as way of tracking the group's progress and decisions.



## OVERVIEW

The Monterey Bay National Marine Sanctuary (MBNMS) is dedicated to collaborating with the public in its effort to protect the marine environment. In the ten years since its designation, numerous agencies, researchers, public and private organizations and community members have helped the Sanctuary identify resource protection issues and strategies to augment its management scheme. These issues were honed through a series of scoping meetings and comment periods conducted in 2001 and 2002 as part of the Sanctuary's Joint Management Plan Review Process (JMPR). Fifteen specific issues that were of principal concern to the public and the Sanctuary were identified as areas for discussion in a working group context.

Water quality has been a frequently raised concern and one that the Sanctuary has addressed in four previous Water Quality Protection Program (WQPP) plans dealing with urban runoff, regional monitoring, marinas and boating, and agriculture. The issue of beach closures and postings has been a frequently raised concern in recent years and one that the Sanctuary has agreed to address in a new WQPP plan to be developed by a working group as a part of the Joint Management Plan Review. The MBNMS and its Sanctuary Advisory Council will look to the JMPR working groups to characterize each issue and identify strategies and activities that address the issue as they meet over the next several months.

## BACKGROUND

The central coast of California is internationally known for its incomparable shoreline. Travelers come from around the world to enjoy outstanding recreational opportunities including surfing, diving and kayaking; to view the spectacular coastal scenery; to observe wildlife resources such as sea otters,

whales, and seabirds; and to enjoy the seemingly pristine beauty of the ocean. In 1992, public concern over the conservation of this exceptional resource led Congress to designate the Monterey Bay National Marine Sanctuary for its ecological significance and singular beauty. Since this designation, runoff and spills along the Sanctuary's coastline have periodically resulted in high levels of coliform bacteria being detected in coastal waters, which has caused hundreds of beaches closures or warnings annually. Beach closures and warning not only signal potential human or marine ecosystem impacts, they can also have a large impact on tourism industry and the economic vitality of jurisdictions that rely on this industry.

Sources of contaminated water include runoff from urban, suburban and rural areas, an aging sewer infrastructure system pressed to meet increasing demands, contaminated flows from creeks and rivers and unidentified sources. Contributing factors that generate these sources include illicit storm drain connections, improper disposal of materials which clog pipes and cause overflows, cracked or damaged pipes, overflow of sewer systems during storm events, septic system leaching, nonpoint pollutant loading exposed to storm runoff, and various domestic and wildlife sources. High levels of coliform bacteria indicate that water has come in contact with human or animal waste, and while coliform bacteria themselves may not impact human health, their presence indicates potential water contamination with other pathogens such as bacteria, viruses, and protozoans. These pathogens have been found to be responsible for human health problems ranging from fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, and hepatitis.

Frequent bacterial contamination not only impacts human health, but evidence also suggests that it is impacting the marine ecosystem. Human pathogens such as gastrointestinal parasites have been documented in local sea otters. Central Coast sea otter populations show abnormally high mortality due to disease, which may be a factor in the slow recovery of the species. There is also a significant aquaculture and kelp harvesting industry within the MBNMS that is highly dependent upon unpolluted water. Such threats to both human and environmental health are serious problems anywhere, but are of particular concern in an area known and designated for the health and diversity of its marine ecosystem.

### *Beach Closures and Warnings*

The decision to close or issue a warning is based upon laboratory methods that determine the probable number of indicator organisms contained in a water sample. Since the identification of pathogens such as viruses in ocean water is difficult, time consuming, and expensive, current water quality testing methodology relies on the usage of the more readily detected and quantified coliform and fecal streptococci bacteria as indicator organisms. These organisms include total coliform, fecal coliform and enterococcus, and while these bacteria themselves may not impact human health, their presence indicates potential water contamination with other pathogens such as bacteria, viruses, and protozoans.

County Health Officers can take three discrete actions including closing a beach, issuing a warning, or announcing a rain advisory based on beach water quality monitoring data, sewage spills, and storm events.

A "Beach (ocean) Closure" occurs as a result of a known sewage spill or from repeated incidences of exceeding bacterial standards due to an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. When a beach is closed, signs are posted alerting the public to stay out of the water.

A "Beach Warning" sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short term, when a single bacterial indicator standard is exceeded, or more permanent where monitoring indicates repeated contamination (e.g. from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).

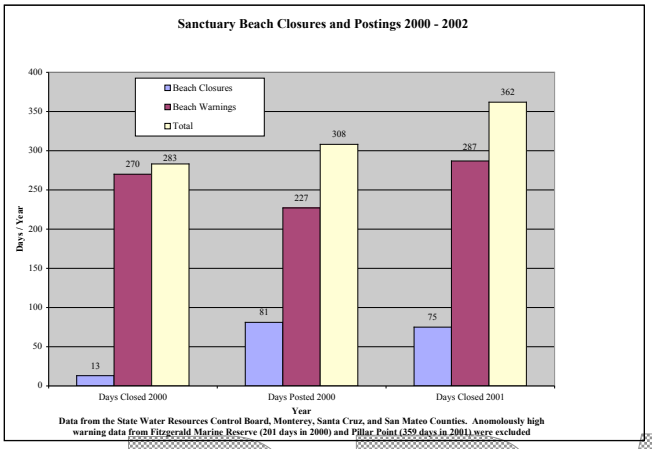
A "Rain Advisory" is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, bacteria counts usually exceed the State standards for recreational water use.[1]

Beginning in 1999, AB411 required local health officers to conduct weekly bacterial testing between April 1 and October 31 of waters adjacent to public beaches that have more than 50,000 visitors annually and are near storm drains that flow in the summer. This increased monitoring is responsible for a pronounced jump in the number of beach closures and postings between 1998 and 1999. However, since this initial jump, Sanctuary beaches have continued to suffer from hundreds of closures or postings each year during 2000 - 2002 (Table 1).



[1] California Beach Closure Report 2000. Division of Water Quality, SWRCB, Cal. EPA

**Table 1 - Sanctuary Beach Closures and Warnings 2000-2002**






The public is concerned with the high number of closures and warnings, and they are also concerned that the methods used to monitor and post beaches are insufficient to accurately detect contamination and warn the public accordingly. This is highlighted by a perceived lack of confidence caused by the "up and down" nature of posting of warning signs. Indicator bacteria assays take 18 to 36 hours to complete and during this time beachgoers may be exposed to harmful pathogens, and by the time the beach is posted, the indicator bacteria may not be present in the nearshore waters. Thus a beach may be open when it is contaminated, and posted when it is clean.

Many types of animals produce the indicator organisms, and a high percentage of beach closures and warnings are the result of unknown or diffuse sources. Data contained in the 2000 California Beach Closure Report shows that statewide,

- 37% of warnings posted and closures statewide were a result of unknown sources;
- 37% were caused by creeks/rivers;
- 12% were attributed to sewer lines;
- 12% to stormdrain/urban runoff;
- 3% to wildlife;
- <1% each to combined sewer overflow, domestic and agricultural animals, and rain.

In viewing this data it is important to recognize that there is a fundamental difference between beach closures and beach warnings. Beach closures result from known sewage spills or repeated exceedances of standards from unknown sources, whereas beach warning are a result of an exceedance

of standards, but where there is no known source of human sewage (Tables 2, 3). Domestic discharges account for a high percentage of beach closures, but closures occur less frequently than warnings.

**Table 2 - Sources of Contamination – Postings**

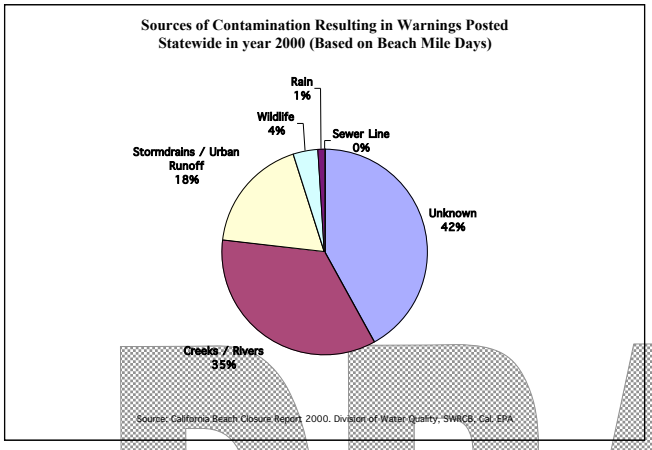
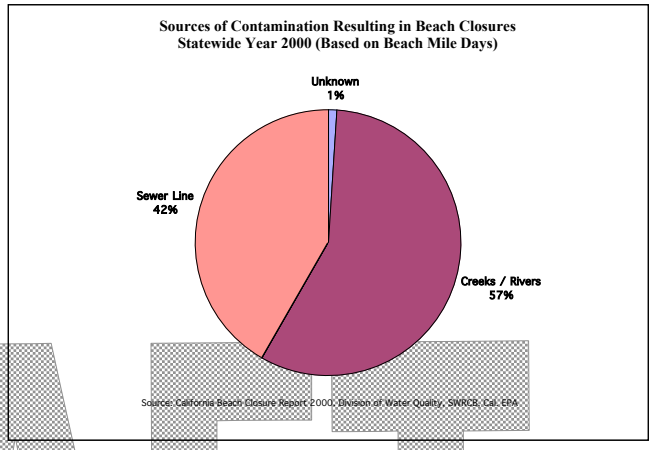



**Table 3 - Sources of Contamination - Closures**






Domestic discharge obviously represents an increased risk to human health, and an emphasis will continue to be placed on maintenance, repair, and illicit discharge detection from publicly owned sewage collection and treatment facilities. However, discharges from these facilities account for a small proportion of the total number of closures and postings. The majority of closures and postings are caused by diffuse or unknown sources, and strategies will also need to be developed that effectively reduce the bacterial loading to these sources. A wide range of potential risks of disease are also associated with the diffuse nature of these sources, illustrating the need for strategies that further research and develop analyses that better characterize nearshore pollution and its effect on human and marine health.

## EXISTING STATUTORY AND REGULATORY FRAMEWORK

The Federal Clean Water Act and the California Water Code (Porter-Cologne Water Quality Control Act) establish the framework under which water quality is regulated in California.

### *Basin Plan and Ocean Standards*

The State of California is divided into nine regional boards that regulate water pollution in their region. Each of these boards is responsible for administering regulations established by the Code, which directs each of the boards to develop a regional water quality control plan, or "Basin Plan." Basin Plans describe the beneficial uses of each of the region's water bodies, including warm and cold-water habitat, fish spawning, recreation, drinking water supply and several others. They also describe the water quality that must be maintained in order to allow those uses.

The regional boards implement the Basin Plans by issuing and enforcing state Waste Discharge Requirements or NPDES permits (National Pollutant Discharge Elimination System, pursuant to the Federal Clean Water Act). Anyone wishing to discharge waste to inland surface waters or the ocean from a pipe or waste facility (a "point source") must obtain a NPDES permit from the regional board. The boards establish monitoring programs to be conducted by the discharger as a way of measuring compliance with permit provisions. Generally, sewer collection systems tributary to treatment facilities are permitted by Waste Discharge Requirements whereas the treatment facilities themselves are permitted through the NPDES system. The State Water Resources Control Board has stated that while sanitary sewer overflows and sewage spills are not subject to minimum mandatory penalties, the California Water Code provides for penalties for unauthorized discharges.[2]

The State Water Resources Control Board is responsible for development and review of the California Ocean Plan, the Regional Boards are responsible for implementing the California Ocean Plan through NPDES permits. The California Department of Health Services has established the State Ocean Water Quality Standards for body contact as follows:

Total Coliform – 10,000 MPN

Fecal Coliform – 400 MPN

Enterococcus – 104 MPN

Where MPN is the most probable number, defined as the statistical concentration of bacteria in 100mL of sample water.



***AB 411***

Increasing concern about beachwater quality prompted the approval of Assembly Bill 411 (AB411, the Right To Know Bill), which amends the Health and Safety Code of the State of California required the California State Department of Health Services to develop statewide beachwater-quality criteria and monitoring regulations. AB 1946 is a follow-on bill to AB 411, and it improves upon data collection requirements and public disclosure standards.

Beginning in 1999, AB411 required local health officers to conduct weekly bacterial testing between April 1 and October 31 of waters adjacent to public beaches that have more than 50,000 visitors annually and are near storm drains that flow in the summer. San Mateo, Santa Cruz, Monterey, and San Luis Obispo counties each have beaches that meet these criteria.

[2] SWRCB General Counsel, Question and Answer Paper. April 17, 2001

### *Sanctuary Enforcement*

The Sanctuary also plays a role in enforcing MBNMS regulations that prohibit discharges directly to the Sanctuary (with a number of exceptions, none which apply here), or discharges from outside the boundary of the Sanctuary that enter and injure a Sanctuary resource. The MBNMS enforcement philosophy is based on preventive enforcement, with a strong emphasis on outreach and education. While the Sanctuary has in the past relied primarily on the two Regional Water Quality Control Boards for enforcement of discharge violations, it does have enforcement capabilities that can result in civil penalties. Sanctuary emergency response staff are also involved when spills occur to gather information on the extent of the spill and assess damage to Sanctuary resources. The Sanctuary also prohibits the construction of new waste water treatment plant outfalls into the Sanctuary.

### *NPDES*

In addition to the point source and waste discharge requirement programs, the State and Regional Boards regulate "nonpoint" source discharges via the Storm Water NPDES program. The storm water program is divided into two phases. Phase I was promulgated in 1987 and regulated "medium" and "large" municipal separate storm sewer systems (MS4s) generally serving populations of 100,000 or greater, construction activity disturbing 5 acres of land or greater, and ten categories of industrial activity. In the Sanctuary watersheds, the City of Salinas is covered under a Phase I permit.

Phase II of this program is now underway, and in 2003, the SWRCB adopted a General Permit for storm water discharges from regulated Small MS4s (municipalities with an urban population of at least 10,000 and a population density of at least 1,000 per square mile), and small construction activities.



### *TMDLs*

TMDLs (Total Maximum Daily Loads) are designated for state waters that show signs of being impaired or impacted for beneficial uses. Waters that do not support their beneficial uses are listed on the 303(d) list of impaired waterbodies. TMDL are load allocations to be developed by the Regional Water Quality Control Boards identifying the total amount of pollution that can be discharged to 303(d) listed waterbodies from all land use categories in the watershed. While several California beaches have been listed on the 2002 303 (d) list for Coliform Contamination, no beaches adjacent to the Sanctuary have yet been included on this list, although requests have been made to the State Board to do so.

## PREVIOUS SANCTUARY EFFORTS RELATED TO COLIFORM CONTAMINATION AND BEACH CLOSURES

The Sanctuary's Water Quality Protection Program (WQPP) is a partnership effort designed to enhance and protect the physical, chemical and biological conditions in the Sanctuary and its adjacent

lands. The WQPP has identified a variety of water quality issues and problems in the Sanctuary and its watersheds including sedimentation, nitrates, persistent pesticides, metals, oil and grease, and detergents, and has developed and initiated implementation of several plans to address them. The WQPP previously identified coliform contamination as a threat to human and ecosystem health, and although it was not a key focal point of previous efforts, several programs undertaken through previous plans have partly addressed the issue.

The Sanctuary's Water Quality Protection Program plans, Action Plan I: Implementing Solutions to Urban Runoff and Action Plan II: Regional Monitoring, Data Sharing and Interagency Coordination, both recommend additional assessments of coliform contamination sources, and follow-up technical strategies to address the urban runoff components of coliform contamination. Volunteer monitoring programs coordinated by the Sanctuary's Citizen Watershed Monitoring Network such First Flush, Urban Watch and Snapshot Day monitoring events have provided several years of data characterizing both wet and dry season urban runoff, including collecting and analyzing samples for bacterial indicator organisms. These data have been useful to local jurisdictions in identifying locations in the watersheds that need additional attention.

The Model Urban Runoff Program, developed by the cities of Monterey and Santa Cruz, the Monterey Bay National Marine Sanctuary, California Coastal Commission and the Regional Water Quality Control Board also includes guidelines for monitoring and source analysis for coliform bacterial and outlines an array of steps for technical follow up and education to reduce inputs.

The WQPP Agriculture and Rural Lands Action Plan was developed in 1999 to address agricultural water quality issues. The Agriculture and Rural Lands program indirectly plays a part in dealing with coliform contamination as sediment fate and transport can play an important role in bacterial survival. The sediment environment is more favorable to bacterial growth and survival, and it has been shown that stream sediments can contain bacteria counts much higher than the overlying water column.[3] Additionally, nutrients are adsorbed on to particulate surfaces, thereby enabling the attached bacteria to grow more rapidly than those in free suspension, and increased turbidity reduces light penetration into the water column, enhancing the survivability of bacteria.

The Sanctuary also works with local jurisdictions to garner financial resources to address coliform contamination issues. Recently, the Monterey Bay Sanctuary Foundation worked with the Cities of Monterey, Pacific Grove, and the Monterey County Department of Environmental Health to submit a joint proposal for funds under the Proposition 40 – Clean Beaches Initiative. The proposal seeks funding for a coordinated approach to addressing the beach closures and postings through sewer

[3] Jensen, P., Hanadi, R., Battenfield, T., Payne, S. **Public Works**. *Identifying Bacteria Sources*.

infrastructure diagnostics and repairs, a genetic source analysis, and monitoring and education programs. The Sanctuary also works with local jurisdictions to raise public awareness of coliform contamination issues. In January of 2001, the Sanctuary co-hosted two public forums with local cities and counties on beach closures designed to share information on the sources of contamination and potential solutions to the problem.

This past work has focused on issues that are related to coliform contamination, but the Sanctuary has not yet dealt comprehensively with the subject of beach closures and postings. Effectively addressing this issue will require a regional approach that cuts across jurisdictional and political boundaries. An effort to reduce coliform contamination and improve beach water quality monitoring will therefore build on the WQPP Memorandum of Agreement designed to facilitate interagency cooperation and signed by eight federal, state, and local entities during Sanctuary designation in 1992. With your help, the Sanctuary hopes to continue to successfully work with stakeholder groups and develop a plan that will effectively characterize the beach closure issue, create strategies to reduce the number of beach closures and postings, and identify funding mechanisms to implement the recommendations.



## GOAL

The goal of the Beach Closure / Coliform Contamination Action Plan is to reduce microbial contamination in Sanctuary waters. Success will be evaluated through the attainment of ocean water quality standards and the reduction of beach closures and postings within the Sanctuary.

## STRATEGY MB-BC-01 RESEARCH

### *Action A: Investigate rapid indicator assessment*

Current indicator analysis requires 18 to 24 hour incubation times. Finding methods that can process samples in less time will reduce the risk to public health by ensuring that water quality is accurately evaluated and posted.

a) Implement methods that will result in quicker turn around times between sample and results *(e.g. biosensors, enzymatic assays, Polymerase Chain Reaction (PCR))*

b) Research and implement real-time, continuous monitoring techniques

c) Team with research organizations with expertise in real-time monitoring – MBARI, Southern California Coastal Water Research Project (SCCWRP), SIMON

### *Action B: Explore other potential indicators*

An ideal indicator organism would be found only when disease-causing agents were present at densities that could cause human health problems. Realizing that current fecal indicators fall short of

this goal, and are neither the most precise nor easily assayed, evaluate alternate indicators such as:

a) *Fecal sterols:* Fecal Sterols, such as coprostanol, is formed in the gut of human and higher mammals by chemical or biological reactions, and tests can differentiate between human and animal sources.

b) *Caffeine:* Caffeine is a compound that is present in numerous beverages as well could be used as an indicator.

c) *Long-chain alkylbenzenes (LABs –synthetic surfactant):* LAB's are widely used as surfactants in commercial detergents, and as they are purely synthetic they are highly indicative of human sources. Because they are present up to one order of magnitude lower than fecal sterols, they are regarded as complimentary to the fecal sterols.

***Action C: Explore the potential to analyze for specific pathogens (e.g.* T. gondii*)***

Indicator organisms do not directly correspond to human health problems, and only indicate the potential presence of pathogens from untreated or partially treated sewage or contaminated runoff. Alternatively, waterborne pathogens are difficult to detect and quantify, and specific methodology to detect them in samples is only in the development stages. Research in this area should be monitored for techniques that allow for the direct measurement agents suspected of impacting human health.

***Action D: Conduct selected genetic studies at key locations.***

It is difficult to pinpoint the exact physical location of the source of bacteriological contamination of beaches. However, distinguishing between anthropogenic and animal sources of contamination will help to better assess health risks and allocate resources. Information on the human or animal origin of fecal pollution gives an indication of the types of pathogens that may be expected, the risk of infection, and the treatment that may be required to control the transmission of disease. Animal fecal pollution is not without risks and, while many of the risks rare unknown, it is generally believed that animal sources pose less risk. Several methods have been studied to varying degrees of success including examining the ratio between fecal coliforms to fecal streptococci or total coliforms, multiple antibiotic resistance (MAR) analysis, ribotype analysis / genetic fingerprinting, and analyzing for human enteric viruses.

a) Coordinate with agencies and scientist on appropriate techniques

***Action E: Coordinate efforts with the SWRCB's Beach Water Quality Workgroup (BWQW) and Southern California Coastal Watershed Project (SCCWP) to leverage efforts and avoid duplication of effort***

## STRATEGY MB-BC- 02 MONITORING

Resources and staffing limit the frequency and number of beaches that can be monitored on a regular basis, and this has the potential to jeopardize public health. This action will seek to develop scientifically justified monitoring protocols to ensure that contact with contaminated waters is reduced to the highest practicable extent. Collaborate with existing monitoring programs, and utilize the best available indicators and analysis equipment developed through ongoing research

***Action A: Include the use of technological advances noted in the research section, such as real time probes, developed through ongoing research to sample beaches more frequently and expand the geographic extent of sampling beyond AB 411 beaches to include those that are visited by less than 50,000.***

a) Target locations with reported incidences of illness or where physical features (e.g. proximity to runoff, enclosed waters) suggest high contamination levels

b) Identify beaches that suggest susceptibility to contaminated runoff, or that are heavily used but with numbers below the 50,000 cutoff. Work with local jurisdictions and the Citizens Monitoring Network to secure funding to monitor these beaches.

c) Expand to locations with reported incidences of illness or where physical features (e.g. proximity to runoff, enclosed waters) suggest high contamination levels

***Action D: Perform upstream monitoring of chronically closed / posted beaches from unknown sources to identify subwatersheds and specific locations contributing to the problem.*** Enlist volunteers to assist in assessment through collaboration with the Citizens Monitoring Network and local public works agencies

## STRATEGY MB-BC-03 NOTIFICATION

User groups must have access to water quality information before they depart for the beach. This strategy will seek to continue and expand upon existing notification systems.

***Action A: Develop improved notification system for user groups***

Ensure that user groups have the appropriate beach status information prior to their departure and if beach are closed or warnings are posted, provide expected date of open status

a) List Servs – continue and expand for divers, diver organizations, and shops

b) Recorded Phone Messages – continue and expand

c) Websites – continue / expand county websites and link to regional Sanctuary website. Evaluate additional links / programs to improve access to information

d) Ensure that groups are aware of notification resources through public relations announcements

e) Build upon Surfrider's fax notification system

## STRATEGY MB-BC-04 GEOGRAPHIC INFORMATION SYSTEMS (GIS)

Geographic Information Systems (GIS) can be a powerful tool that decision makers can use to define problems and allocate resources. Local jurisdictions are encouraged to utilize GIS when making decisions about infrastructure replacement or when performing upstream analysis. Project prioritization could be determined by their proximity to sensitive areas or heavily used beaches.

***Action A: Encourage local jurisdictions to map septic sewer and storm drain lines, and to record data on reported spills, blockages, and lateral line cleaning work***

a) Coordinate efforts with those developing Sewer System Management Plans

a) Coordinate methods including software, projections, formats

b) Encourage data and technology sharing between jurisdictions

***Action B: Utilize GIS for identification to determine problem infrastructure areas, sensitive habitats, land uses, outfall locations, and critical beaches***

***Action C: Determine proximity of problems to sensitive areas and heavily used beaches to develop priorities and generate funding***

## STRATEGY MB-BC-05 SOURCE CONTROL

The working group identified private and public sanitary sewer systems, septic systems, and urban runoff as primary routes of anthropogenic bacterial contamination. The following are actions that will seek to reduce the input of contamination from the various sources.

***Action A: Enhance repair and replacement of sewer mains***

a) Prepare a regional list of main line repair and replacement projects drawing on those developed by local jurisdictions; tie-in to GIS database

b) Rank projects based on downstream closures and postings, proximity to sensitive resources, or high-use beaches

c) Leverage this information and Action Plan to pursue and obtain funding sources

***Action B: Reduce the number of sanitary system overflows and exfiltration from publicly owned sewage collection systems***

*Blockage*

Team with entities developing Sewer System Management Plans required by Waste Discharge Requirements.

a) Leverage resources and assist in the development of new materials and programs.

b) Expand these programs to a regional level.

c) Assist with the development source control measures and public outreach and education, focused on preventing sewer system overflows

d) Monitor development of legally binding procedures to control infiltration, ensure proper installation, testing, and inspection of sewers, and to limit the introduction of fats, grease, and other materials that cause blockages

e) Develop local or regional approved vendor list, franchise, or program similar to clean business certification program for grease haulers and line clearing vendors

d) Investigate alternative main line cleaning technologies

e) Assist local jurisdictions in funding line clearing and pump station maintenance / repair activities

f) Encourage jurisdictions to require reporting of interceptor / trap cleaning and lateral cleaning. Encourage tracking in GIS.

g) Conduct technical training / public education and outreach

*Illicit Connections*

a) Continue and expand detection program under Phase II efforts

***Action C: Reduce the number of system upsets caused by Private laterals***

Create mechanisms that identify and correct chronic problem areas. Additional educational efforts are listed under education. Resources and private property issue prevent cities from inspecting laterals. However, several programs have been implemented that deal with the issue of overflows caused by or

located in laterals. This strategy encourages cities to implement a method that will reduce the number of overflows from laterals.

a) 3 Strike Ordinance – If city crews are called to a site three times in a one-year period, issue a cease and desist order to the homeowner to repair problem within ten days. If the problem is classified as a nuisance, city crews can fix immediately.

b) Sale / transfer inspection program – Ordinance that requires the inspection of laterals prior to the sale or transfer of a property.

c) Develop "approved" vendor list for the Sanctuary cities and counties

***Action D: Reduce input from septic systems***

a) Develop GIS layer of houses on septic systems and correlate to problem areas based on data from Citizens, city, county, and AB411 monitoring efforts

b) Target areas suspected of impacting water quality with educational materials

c) Inform citizens on proper use and maintenance

d) Ensure that pumpers are reporting system maintenance and require pumpers to submit logs

e) Encourage local jurisdictions to implement sale / transfer inspection program

***Action E: Reduce microbial contamination from urban runoff / storm drain***

a) Coordinate Beach Closure action plan strategies with the Urban Runoff action plan, MURP, MERITO, and Phase II programs.

b) Leverage efforts to prepare regional educational, outreach and technical materials that address the issue of beach closure.

c) Investigate cost effective measures to treat or divert urban runoff where source control measures prove ineffective

d) Increase number of RV pump-out stations and provide incentives for their use

e) Remove sediments in storm drains prior to first rains of the season

f) Develop mechanism to address waste from homeless camps

g) Pet Droppings - Utilize existing materials and as necessary develop new methods, materials, or devices that will ensure that people clean up after their pets

## STRATEGY MB-BC-06 TECHNICAL TRAINING

Raise the level of awareness of each of these industries to their impacts on the overall system. Let plumbers know that line cleaning can move clogs into city mains, train restaurant personnel in the proper use and maintenance of grease equipment, and promote a reporting program that will alert city staff to potential problems, e.g. problem laterals, behavioral problems, septic system malfunctions, improper grease disposal

***Action A: Educate plumbers, grease trap, and sewer industry on proper cleaning techniques, promote reporting program***

a) Raise the level of awareness of each of these industries to their impacts on the overall system

b) Train restaurant personnel in the proper use and maintenance of grease equipment

c) Promote a reporting programs

***Action B: Utilize existing, or adapt new outreach / training modules for targeted public servants (e.g. planners, technical personnel - coordinate with Phase II efforts and existing MBNMS materials)***

***Action C: Develop spill response training module (see emergency response strategy)***



## STRATEGY MB-BC-07 EDUCATION

***Action A: Develop coordinated regional education program building and expanding on existing materials and efforts.***

Coordinate with regional Phase II efforts and use existing MBNMS educational material. MERITO, and the Urban Runoff action plan education efforts. Utilize MBNMS to provide coordinated support to ensure consistent messages, facilitate collaboration with various groups, and leverage resources. Education should include the following courses:

***Action B: Develop public's understanding of the importance of reducing microbial contamination, the sources of contamination, and how they can be a part of the solution***

***Action C: Develop understanding need for local funding to deal with issue***

**STRATEGY MB-BC-08 ENFORCEMENT**

***Action A: Encourage fair and consistent enforcement of discharges under the SWRCB's Enforcement Policy and Sanctuary Discharge Regulations***

a) Review past enforcement efforts by the RWQCB's for consistency with the SWRCB's "Water Quality Enforcement Policy"

***Action B: Develop a notification mechanism between the RWQCB's and the Sanctuary***

a) Update the MOA with RWQCB's to ensure that the Sanctuary will be notified of new and ongoing enforcement investigations and all incidents involving the discharge of untreated or partially treated wastewater

***Action C: Coordinate enforcement actions with the RWQCB's***

Sanctuary regulations provide for civil penalties for discharges directly into the Sanctuary or for discharges from outside the boundary of the Sanctuary that enter and injure a Sanctuary resource. Historically, the Sanctuary has relied on the RWQCB's for enforcement of sewage discharges, however in some instances (based on nature of discharge, agency resources, impact to Sanctuary, etc.) the Sanctuary may want to take the lead on enforcement. Notification mechanisms developed in Action B will facilitate this action.

**STRATEGY MB-BC-09 EMERGENCY RESPONSE**

***Action A: Investigate options for notification system which will inform key agencies, including the Sanctuary, of spills when they occur***

***Action B: Develop cross-departmental, on-call systems, that will ensure rapid, 24 hour a day spill response***

a) Utilize continual on-call departments to reduce potential lag time associated with the mobilization of off-duty departments

***Action C: Develop spill response program that ensures proper techniques for containment, disinfection, and source control***

Build off of Combined Sewer Overflow Technology Fact Sheets developed by the EPA.

## STRATEGY MB-BC-07 FUNDING

***Action A: Sanctuary coordinate with local jurisdictions to locate funding sources and leverage action plans and monitoring results to secure funds for strategy implementation***

a) State bond and proposition funds

b) California Coastal Conservancy, SWRCB and RWQCB's

c) Federal Sources

d) League of California Cities

e) Quantify economic loss from beach closures – e.g. to support grant writing efforts

***Action B Build public support for utility fees, bonds, or other local funding initiatives***

Recent spills, beach closures, warnings, and studies linking human pathogens to sea otters have raised public awareness to the issue of microbial contamination of Sanctuary waters. However, many citizens do not realize the costs associated with addressing the issues and the burden that local jurisdictions face. A component of this strategy as well as the public education and outreach strategy, will seek to develop public support for bonds, fees, or other local initiatives that can pay for some of this much needed work.